

WHAT IS CLAIMED IS:

1. A Raman amplification optical fiber for Raman-amplifying signal light including a plurality of wavelength components when Raman amplification pumping light is supplied thereto, said Raman amplification optical fiber, as characteristics at each wavelength of said signal light, having:

5 a chromatic dispersion with an absolute value of 6 ps/nm/km or more but 20 ps/nm/km or less;

10 an effective area  $A_{\text{eff}}$  of 20  $\mu\text{m}^2$  or less; and a Raman gain coefficient  $G_R/A_{\text{eff}}$  of  $0.005 (\text{W}\cdot\text{m})^{-1}$  or more.

2. An optical fiber coil including the Raman amplification optical fiber according to claim 1 wound in a stacked fashion.

15 3. A Raman amplifier for Raman-amplifying signal light including a plurality of wavelength components introduced from an input end thereof and outputting thus amplified signal light from an output end thereof, said Raman amplifier comprising:

20 the Raman amplification optical fiber according to claim 1, said Raman amplification optical fiber being disposed between said input end and said output end and constituting at least a part of a transmission line between said input end and said output end; and

25 a pumping light supplier optically connected to at least one end of said Raman amplification optical fiber, said

10 pumping light supplier supplying said Raman amplification pumping light to said Raman amplification optical fiber.

5 4. A Raman amplifier according to claim 3, wherein cumulative chromatic dispersion from said input end to said output end has an absolute value of 100 ps/nm or less at each wavelength of said signal light.

15 5. An optical communication system comprising:  
a transmission line through which signal light including a plurality of wavelength components propagates;  
and  
the Raman amplifier according to claim 3.

20 6. An optical communication system according to claim 5, wherein at least one wavelength included in said signal light exists within C band of 1530 nm to 1565 nm.

25 7. An optical communication system according to claim 5, wherein at least one wavelength included in said signal light exists within L band of 1565 nm to 1625 nm.

8. An optical communication system according to claim 5, wherein at least one wavelength included in said signal light exists within S band of 1460 nm to 1530 nm.

25 9. A Raman amplification optical fiber for propagating signal light including a plurality of wavelength components, and Raman-amplifying said signal light when Raman amplification pumping light is supplied thereto; said Raman amplification optical fiber, as characteristics at each wavelength of said signal light, having:

a chromatic dispersion with an absolute value of 6 ps/nm/km or more but 20 ps/nm/km or less; and  
an effective area  $A_{eff}$  of less than  $15 \mu\text{m}^2$ .

10 5 10. A Raman amplification optical fiber according to  
claim 9, further having a Raman gain coefficient  $G_R/A_{eff}$  of  
 $0.005 (\text{W}\cdot\text{m})^{-1}$  or more at each wavelength of said signal light.

11. An optical fiber coil including the Raman  
amplification optical fiber according to claim 9 wound in  
a stacked fashion.

15 10 15. 12. A Raman amplifier for Raman-amplifying signal  
light including a plurality of wavelength components  
introduced from an input end thereof and outputting thus  
amplified signal light from an output end thereof, said Raman  
amplifier comprising:

15 20 15. the Raman amplification optical fiber according to  
claim 9, said Raman amplification optical fiber being  
disposed between said input end and said output end and  
constituting at least a part of a transmission line between  
said input end and said output end; and

20 25 20. a pumping light supplier optically connected to at least  
one end of said Raman amplification optical fiber, said  
pumping light supplier supplying said Raman amplification  
pumping light to said Raman amplification optical fiber.

25 20. 13. A Raman amplifier according to claim 12, wherein  
cumulative chromatic dispersion from said input end to said  
output end has an absolute value of 100 ps/nm or less at

each wavelength of said signal light.

14. An optical communication system comprising:  
a transmission line through which signal light  
including a plurality of wavelength components propagates;  
and

5 the Raman amplifier according to claim 12.

10 15. An optical communication system according to  
claim 14, wherein at least one wavelength included in said  
signal light exists within C band of 1530 nm to 1565 nm.

16. An optical communication system according to  
claim 14, wherein at least one wavelength included in said  
signal light exists within L band of 1565 nm to 1625 nm.

15 17. An optical communication system according to  
claim 14, wherein at least one wavelength included in said  
signal light exists within S band of 1460 nm to 1530 nm.